1: Poult Sci 1995 Jan;74(1):152-60

Changes in some egg components and analytical values due to hen age.

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The influence of hen age on some egg characteristics was studied. Two commercial breeds of brown hens, namely Warren and Hy-Line, were considered at seven different ages. The variables analyzed were the weights of yolk and thick and thin albumen, pH, and the concentration of glucose, uridine, and uric and pyroglutamic acids of separated yolk and albumen. Albumen and yolk average weights and the proportion of yolk in the edible part of egg increased with hen age, whereas the average ratio of thick to thin albumen was not influenced by the progress of the laying cycle. Glucose, uridine, and uric acid were also not influenced by hen age. Pyroglutamic acid, which is detectable in yolk and not in the albumen of a fresh egg, showed a characteristic trend in yolk. Its concentration dramatically increased in the middle of the laying cycle and then decreased to values close to those observed in eggs of the young layers.

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1: Poult Sci 1999 Apr;78(4):591-4

Comparison of physical quality and composition of eggs from historic strains of single comb White Leghorn chickens.

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The effect of long-term genetic selection on physical quality and composition of eggs was determined by analyzing eggs acquired from Agriculture Canada: Ottawa Control Strain 5 (CS5) from a 1950 base population, 7 (CS7) from a 1958 population and 10 (CS10) from a 1972 population. Eggs from the H&N "Nick Chick" current commercial strain (CCS) were also included. Eggs were collected monthly over a 62-wk laying period and analyzed for egg, albumen, shell and yolk weight; albumen protein, solids and pH; percentage yolk solids and fat; Haugh units; and specific gravity. Significant ($P < 0.05$) differences found between strains included a progressive increase in weight of eggs from the CS5 to CCS. Although the eggs increased in size, no significant differences were found between strains for specific gravity or percentage shell weight. Yolk weights of eggs from the strains examined did not differ. However, the percentage of yolk found in current strain eggs was significantly lower ($P < 0.05$), with a subsequent higher percentage albumen due to the increase in egg size of the CCS. Haugh units were significantly higher in the CS10 and CCS strains than in the other strains. No significant differences between strains were seen in albumen protein, solids, pH, or yolk solids. Mean percentage yolk fat assay values for eggs from the CS5, CS7, CS10, and CCS strains were 33.08, 32.68, 32.84, and 32.40, respectively. Percentage yolk fat values obtained from CCS were significantly lower ($P < 0.05$) than those obtained from the other strains. The results from this study indicate that genetic selection has produced larger eggs containing a lower percentage of yolk while overall egg quality has been maintained or improved.

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1: Comp Biochem Physiol B Biochem Mol Biol 1999 May;123(1):9-16

Plasma lipoprotein changes in hens (Gallus domesticus) during an induced molt.

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Blood plasma lipoproteins were studied during food and light deprivation or prolactin injection-induced involution of ovarian follicles (molt) of laying hens. Egg laying stopped 3 days after initiation of either treatment. Food and light-deprived hens lost 29% of initial body weight during the 10-day experiment ($P < 0.05$), whereas prolactin-treated hens lost 9% of body weight. Yolk-directed very low density lipoprotein (VLDLy) concentration in plasma decreased in both groups, but declined more rapidly in food and light-deprived hens. Very low density lipoprotein triacylglycerol decreased 40% in food and light-deprived hens by day 2 compared with a 13% decrease in the prolactin-treated hens. By day 5, a lipoprotein particle 21-22 nm in diameter appeared in the $d = 1.019$-1.046 g/ml density fraction of plasma in both groups. A similar lipoprotein particle, termed HDLR, developed in overfed hens with involuting ovarian follicles. In conclusion, hens undergoing ovarian regression due to food and light deprivation, prolactin treatment or overfeeding display marked decreases in plasma yolk-directed very low density lipoproteins and the appearance of HDLR. Other lipoprotein populations varied depending on whether the hens continued to feed or not.

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